

## STOA NEWS

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### New STOA Project “Feeding 10 Billion People”

STOA has recently set up a new project in which the problems and options of securing food supply for a constantly growing global population will be assessed. The project “Feeding 10 Billion People” is based on the premise that climate change and the world’s growing population are two key drivers of change as global and European food security is under threat. Crop productivity must increase due to demographic pressures, resource limitations and environmental changes. In addition to increasing food production, food availability can only be guaranteed by reducing crop losses and food waste. These issues are dealt with in four sub-studies. The final report is expected to be available in September next year. ITAS as a member of ETAG will carry out two studies in the context of this project, which are mentioned below.

#### Technology Options for Plant Breeding and Innovative Agriculture

This study will analyse how farming management concepts, practices and technologies, including plant breeding technologies, could enable sustainable intensification of crop production, with the aim to increase food production and support food security. The study addresses agriculture in developing countries and industrialised countries (Europe), small-scale and large-scale farming, as well as extensive and intensive agricultural production systems, and intends to cover a wide range of practices (low to high tech). With a view to the vast majority of farmers in developing countries, which are small-scale farmers producing on less than two hectares, the study will build on a former STOA project carried out by ETAG on “Agricultural Technologies for Developing Countries”, which investigated the contribution of selected important agricultural production systems and technologies with focus on small-scale farmers in developing countries. Three main topics are covered in the study:

- Reducing the yield gap – sustainable intensification and improvement of crop management
- Increasing the yield potential – plant breeding
- Reducing crop losses

Many regions show large yield gaps, which is the gap between actual production per hectare and potential yields. Therefore, it makes sense to explore the potential for increasing production from already cultivated land and existing cultivars, independent of progress in plant breeding. Three important objectives of improved crop production under changing environmental conditions (e.g. climate change) are: (1) to increase production by better exploring genetic yield potentials, (2) to improve input use by higher production efficiency, and (3) to enhance the site specific yield potential by improved land productivity. Starting with an analysis of the major constraints on food crop production (such as abiotic stress, soil fertility, crop nutrition, pests, diseases and weed competition, energy and labour demand in production, environmental impacts), appropriate technologies will be scanned and relevant crop production system approaches for sustainable intensification will be analysed.

In the past, plant breeding has made a major contribution (about half of the higher yields) to higher food supply and to the fact that increasing crop production has mostly taken place on already cultivated land. Also in the future, success in plant breeding is needed as an important basis for higher yields and increased production. At the same time, plant breeding will have to contribute to climate change adaptation, higher production efficiency and more environmental-friendly agricultural production systems. Based on a breeding in production system approach, all relevant existing and upcoming plant breeding technologies – from conventional techniques to breeding with genetically modified organisms (GMOs) – will be assessed.

Post-harvest losses of staple food crops in industrialised countries are generally considered to be low and not significant under normal circumstances. In developing countries, post-harvest handling and storage are stages in the food supply chain of staple foods with relatively high food losses. Therefore, this last topic will concentrate on developing countries and staple foods (due to their overall importance for food supply). The losses in the food supply chain will be ana-

lysed until farm gate: This includes harvesting, post-harvest handling and storage, transport and distribution by farmers, taking into account that technology options for reducing crop losses are in many cases dependent on improvements in education, management, infrastructure, etc.

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### Options for Cutting Food Waste

The aim of this study is to support the resolution of the European Parliament to reduce food waste by 50 % by 2025. The resolution notes that every year in Europe a growing amount of healthy, edible food – some estimates say up to 50 % – is lost along the entire food supply chain, in some cases all the way up to the consumer, and becomes waste. A study published by the European Commission estimates annual food waste generation in the 27 Member States at approximately 89 million tonnes, varying considerably between individual countries and the various sectors, without even considering agricultural food waste or fish catches returned to the sea. Total food waste will have risen by 40 % by 2020 unless additional preventive actions or measures are taken.

The study will summarise existing research studies on food waste in Europe and will look into the various measures to avoid food waste that are suggested in the current debate. Besides persuasive, regulatory and economic approaches, the study will focus on the potential of behaviour-changing technologies and technologies that minimise food waste or spoilage caused by retailers and consumers. Technical options like nano-detectors to prove food contamination with micro-organisms, intelligent packaging, or self-controlling systems like intelligent refrigerators or intelligent supermarket trolleys will be considered. Also the potential of management options and marketing techniques will be addressed. The results of a pilot survey carried out at the Joint Research Centre of the European Commission in Ispra and the University of Bologna on household food waste will feed into this study as well.

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### European Technology Assessment Group

Als federführende Institution einer Gruppe von europäischen Einrichtungen berät das ITAS seit Oktober 2005 das Europäische Parlament in Fragen der sozialen, ökonomischen und ökologischen Bedeutung neuer wissenschaftlich-technischer Entwicklungen. Schon Ende der 1980er Jahre hatte das Europäische Parlament das sogenannte STOA-Panel (Scientific and Technological Options Assessment) als parlamentarisches Gremium zur Technikfolgenabschätzung eingerichtet. Ihm gehören 15 Europa-Abgeordnete aus verschiedenen Ausschüssen des Europäischen Parlaments an. Angesichts der wachsenden Bedeutung der europäischen Wissenschafts- und Technologiepolitik hat das Europäische Parlament beschlossen, die wissenschaftliche Basis der Arbeit von STOA durch die feste Einbindung von in der Technikfolgenabschätzung ausgewiesenen wissenschaftlichen Institutionen zu stärken. Der „European Technology Assessment Group“ (ETAG) gehören führende TA-Einrichtungen mit langjähriger Erfahrung in der parlamentarischen Politikberatung an:

- das Institut für Technikfolgenabschätzung und Systemanalyse, welches das Büro für Technikfolgenabschätzung beim Deutschen Bundestag betreibt,
- das Danish Board of Technology, welches für das dänische Parlament Beratungsdienste leistet,
- das Institute Society and Technology, die TA-Institution des flämischen Parlaments,
- das Rathenau Institute, die zentrale TA-Institution in den Niederlanden, welche auch für das niederländische Parlament arbeitet,
- das Institut für Technikfolgen-Abschätzung der Österreichischen Akademie der Wissenschaft, das auch für das österreichische Parlament arbeitet,
- das Fraunhofer-Institut für Systemtechnik und Innovationsforschung (ISI), das am Büro für Technikfolgen-Abschätzung beim Deutschen Bundestag mitwirkt,
- CAPCIT (Consell Assessor del Parlament sobre Ciència i Tecnologia) – der Beratungsausschuss für Wissenschaft und Technologie beim katalanischen Parlament,
- Technology Centre AV CR, die führende Foresight-Einrichtung der Tschechischen Republik.

ITAS ist neben der konkreten Projektarbeit zuständig für die Koordination innerhalb der Gruppe, die Kommunikation mit dem Europäischen Parlament und die Kooperation mit TA-Einrichtungen außerhalb der Gruppe, die angeboten haben, die Arbeit von ETAG für das Europäische Parlament zu unterstützen.